WHAT IS CLAIMED IS:

1. A process of manufacturing a liquid crystal display device of transverse electric-field type including (a) a pair of substrates at least one of which is transparent, (b) a layer of a liquid crystal composition interposed between the pair of substrates, (c) a plurality of scanning lines driven by an external scanning-line driver circuit through scanning-line terminal portions and extending in a line direction, (d) a plurality of image-signal wires extending in a column direction, (e) picture-element electrodes corresponding to respective picture elements, (f) common electrodes cooperating with said picture-element electrodes, and (g) thin-film transistor elements connected to said scanning lines and said image-signal wires, and wherein said scanning lines, said image-signal wires, said picture-element electrodes, said common electrodes and said thin-film transistor elements are provided on a surface of one of said pair of substrates which faces said layer of the liquid crystal composition, said process comprising:

a halftone exposing step of exposing a photoresist on said one of said pair of substrates to a radiation, and thereby forming (i) first positive resist portions that cover portions of a semiconductor layer formed on said one substrate, which portions correspond to said thin-film transistor elements, each of said first positive resist portions having a predetermined first thickness, (ii) resist-free areas that cover portions of said semiconductor layer which correspond to a first connecting portion, a second connecting portion and a third connecting portion, said first connecting portion being provided to form first static-electricity protective transistor elements connecting said common electrodes and said scanning lines, said second connecting portion being provided to form second static-electricity protective transistor elements connecting said common electrodes and said image-signal wires, and said third connecting portion connecting said external scanning-line driver circuit and said scanning-line terminal portions, and (iii) second positive resist portions having a second thickness smaller than said first thickness and covering the other portions of said semiconductor layer.

2. The process according to claim 1, wherein said halftone exposing step is implemented by using a halftone photomask having a fully light-transmitting area, a semi-light-transmitting area and a fully light-shielding area, such that said first positive

resist portions having said first thickness are formed with said fully light-shielding area of said halftone photomask preventing said radiation from exposing the portions of the semiconductor layer which correspond to said thin-film transistor elements, and said resist-free areas are formed with said fully light-transmitting area of said halftone photomask permitting said radiation to expose the portions of the semiconductor layer which correspond to the first, second and third connecting portions of said semiconductor layer, while said second positive resist portions having said second thickness are formed with said semi-light-transmitting area of said halftone photomask permitting partial exposure of said other portions of said semiconductor layer to said radiation.

3. A process according to claim 1, wherein said halftone exposing step is implemented by using a photomask having a fully light-transmitting area and a fully light-shielding area, while said photoresist on said semiconductor layer is exposed through said photomask to a ultraviolet radiation whose irradiation energy density is determined so as to remove only a portion of a thickness of said photoresist, said halftone exposing step being implemented such that said first positive resist portions having said first thickness are formed with said fully light-shielding area of said photomask preventing said ultraviolet radiation from exposing said portions of the semiconductor layer which correspond to said thin-film transistor elements, while said second positive resist portions having said second thickness are formed with said fully light-transmitting area of said photomask permitting said ultraviolet radiation to expose said other portions of the semiconductor layer, and wherein said halftone exposing step further includes an operation performed after said first and second positive resist portions are formed, to form said resist-free areas by exposing portions of said photoresist exposed to said ultraviolet radiation, which portions cover the portions of the semiconductor layer corresponding to said first, second and third connecting portions, such that said portions of the photoresist are exposed to a radiation through another photomask different from said photomask used to form said first and second positive resist portions, or to respective spot lights of a condensed ultraviolet radiation.

4. A process according to claim 1, wherein said halftone exposing step is implemented by using a photomask having a fully light-transmitting area and a fully light-shielding area, while said photoresist on said semiconductor layer is exposed through said photomask to a ultraviolet radiation whose irradiation energy density is determined so as to remove only a portion of a thickness of said photoresist, said halftone exposing step being implemented such that said first positive resist portions having said first thickness are formed with said fully light-shielding area of said photomask preventing said ultraviolet radiation from exposing said portions of the semiconductor layer which correspond to said thin-film transistor elements, and said second positive resist portions having said second thickness are formed with said fully light-transmitting area of said photomask permitting said ultraviolet radiation to expose said other portions of the semiconductor layer, while at the same time said resist-free areas are formed by exposing portions of said photoresist covering the portions of the semiconductor layer corresponding to said first, second and third connecting portions, to respective spot lights of a condensed ultraviolet radiation.

5. A liquid crystal display device of transverse electric-field type manufactured by a process as defined in claim 1.

6. A liquid crystal display device of transverse electric-field type according to claim 5, wherein said first and second connecting portions have widths which are about 1/2 to about 1/100 of that of said third connecting portion.

7. A scan-exposing device used in a process of manufacturing a liquid crystal display device of transverse electric-field type as defined in claim 1, comprising:

a film-thickness measuring device operable to measure an actual value of said second thickness of said second positive resist portions formed in said halftone exposing step; and

a feedback control device operable to feedback-control an amount of exposure of said photoresist to said radiation, depending upon the actual value of the second thickness of said second positive resist portions measured by said film-thickness measuring device.

8. A scan-exposing device used in a process of manufacturing a liquid crystal display device of transverse electric-field type as defined in claim 1, comprising:

a white light interferometer operable to measure at least one of (a) a difference between actual values of said first and second thicknesses of said first and second positive resist portions formed in said halftone exposing step, and (b) the actual value of said second thickness said second positive resist portions with respect to said resist-free areas; and

a feedback control device operable to feedback-control an amount of exposure of said photoresist to said radiation, depending upon said at least one of said difference and said actual value of said second thickness which has been measured by said white light interferometer.

9. A scan-exposing device used in a process of manufacturing a liquid crystal display device including a pair of substrates at least one of which is transparent, and a layer of a liquid crystal composition interposed between the pair of substrates, said scan-exposing device being operable to scan-expose a photoresist applied to one of said pair of substrates, to a ultraviolet radiation through a quartz photomask substrate having a desired light-shielding pattern, said scan-exposing device comprising:

at least one Bernoulli chuck of non-contact type disposed so as to be opposed to one of opposite surfaces of said one substrate upon which said ultraviolet radiation is incident, said at least one Bernoulli chuck being operable to reduce an amount of deflection of said quartz photomask substrate due to its own weight while sad quartz photomask substrate is placed in a horizontally extending position;

a laser displacement meter operable to measure an amount of displacement of said one of opposite surfaces of said quartz photomask substrate in a vertical direction; and

a substrate-position control device operable to control said at least one Bernoulli chuck on the basis of the amount of vertical displacement measured by said laser displacement meter, while said photoresist is scan-exposed to the ultraviolet radiation through said quartz photomask substrate.

10. A liquid crystal display device of transverse electric-field type manufactured by using a scan-exposing device according to claim 9.

11. A scan-exposing device used in a process of manufacturing a liquid crystal display device including a pair of substrates at least one of which is transparent, and a layer of a liquid crystal composition interposed between the pair of substrates, said scan-exposing device being operable to scan-expose a photoresist applied to one of said pair of substrates, through a quartz photomask substrate having a desired light-shielding pattern, said scan-exposing device comprising:

a quartz substrate disposed in opposition to said quartz photomask substrate and cooperating with said quartz photomask substrate to define therebetween an air-tight space;

a pressure sensor operable to detect a pressure within said air-tight space; and

a pressure control device operable to control a difference between the pressure within said air-tight space measured by said pressure sensor and an atmospheric pressure such that the pressure within the air-tight space is lower than the atmospheric pressure by said difference so as to reduce an amount of deflection of said quartz photomask substrate due to its own weight, while said photoresist is scan-exposed through said quartz photomask substrate.

12. A liquid crystal display device of transverse electric-field type manufactured by using a scan-exposing device according to claim 11.

13. A scan-exposing device used in a process of manufacturing a liquid crystal display device including a pair of substrates at least one of which is transparent, and a layer of a liquid crystal composition interposed between the pair of substrates, said scan-exposing device being operable to scan-expose a photoresist applied to one of said pair of substrates, through a photomask having a desired light-shielding pattern, said scan-exposing device comprising:

a slide carrying said one of the pair of substrates;

photomask scan-exposing means for scan-exposing said photoresist while said photomask and said slide are moved at a same speed in a same direction; and

spot scan-exposing means for directly spot scan-exposing said photoresist without using said photomask, with a spot size ranging from about 0.1mm to about 0.5mm,

and wherein said photomask scan-exposing means and said spot scan-exposing means are operable concurrently to expose said photoresist.

14. A liquid crystal display device of transverse electric-field type manufactured by using a scan-exposing device according to claim 13.

15. A scan-exposing device according to claim 13, wherein said photomask scan-exposing means is operable to expose said photoresist through said photomask to a ultraviolet radiation whose irradiation energy density is determined so as to remove only a portion of a thickness of said photoresist, and said spot scan-exposing means includes a spot scan-exposing optical system operable to expose the photoresist to a spot light of a condensed ultraviolet radiation,

and wherein said photomask scan-exposing means and said spot scan-exposing means are operable in one of two modes: consisting of: a mode in which said spot scan-exposing means is operated after an operation of said photomask scan-exposing means; and a mode in which said spot scan-exposing means is operated to expose said photoresist in a direct direction while said photomask scan-exposing means is operated to expose said photoresist in said first direction, and said spot scan-exposing means is operated to expose said photoresist in a second direction perpendicular to said first direction after a photomask scan exposure of said photoresist by said photomask scan-exposing means is completed over an entire surface areas of said photoresist.

16. A process of manufacturing a liquid crystal display device of transverse electric-field type including (a) a pair of substrates at least one of which is transparent, (b) a layer of a liquid crystal composition interposed between the pair of substrates, (c) a plurality of scanning lines driven by an external scanning-line driver circuit through scanning-line terminal portions and extending in a line direction, (d) a plurality of image-signal wires extending in a column direction, (e) picture-element electrodes corresponding to respective picture elements, (f) common electrodes cooperating with said picture-element electrodes, and (g) thin-film transistor elements connected to said scanning lines and said image-signal wires, and wherein said scanning lines, said image-

signal wires, said picture-element electrodes, said common electrodes and said thin-film transistor elements are provided on a surface of one of said pair of substrates which faces said layer of the liquid crystal composition, said process comprising:

a first photomasking step of forming a positive resist that covers portions of a semiconductor layer formed on said one substrate, which portions correspond to gate electrodes of said thin-film transistor elements and said common electrodes;

a second photomasking step of forming a positive resist that covers portions of said semiconductor layer which correspond to said thin-film semiconductor elements, and forming resist-free areas that cover portions of said semiconductor layer which correspond to a first connecting portion, a second connecting portion and a third connecting portion, said first connecting portion being provided to form first static-electricity protective transistor elements connecting said common electrodes and said scanning lines, said second connecting portion being provided to form second static-electricity protective transistor elements connecting said common electrodes and said image-signal wires, and said third connecting portion connecting said external scanning-line driver circuit and said scanning line terminal portions;

a third photomasking step of forming a positive resist that covers portions of said semiconductor layer which correspond to source electrodes and drain electrodes of said thin-film transistor elements, and said picture-elements electrodes; and

a fourth photomasking step of forming a positive resist for forming contact holes of said scanning-line terminal portions and contact holes of image-signal wire terminal portions.

17. A process of manufacturing a liquid crystal display device of transverse electric-field type including (a) a pair of substrates at least one of which is transparent, (b) a layer of a liquid crystal composition interposed between the pair of substrates, (c) a plurality of scanning lines driven by an external scanning-line driver circuit through scanning-line terminal portions and extending in a line direction, (d) a plurality of image-signal wires extending in a column direction, (e) picture-element electrodes corresponding to respective picture elements, (f) common electrodes cooperating with said picture-element electrodes, and (g) thin-film transistor elements connected to said

scanning lines and said image-signal wires, and wherein said scanning lines, said image-signal wires, said picture-element electrodes, said common electrodes and said thin-film transistor elements are provided on a surface of one of said pair of substrates which faces said layer of the liquid crystal composition, said process comprising:

a first photomasking step of forming a positive resist that covers portions of a semiconductor layer formed on said one substrate, which portions correspond to gate electrodes of said thin-film transistor elements and said common electrodes;

a second photomasking step of forming a positive resist that covers portions of said semiconductor layer which correspond to said thin-film semiconductor elements, and forming resist-free areas that cover portions of said semiconductor layer which correspond to a first connecting portion, a second connecting portion and a third connecting portion, said first connecting portion being provided to form first static-electricity protective transistor elements connecting said common electrodes and said scanning lines, said second connecting portion being provided to form second static-electricity protective transistor elements connecting said common electrodes and said image-signal wires, and said third connecting portion connecting said external scanning-line driver circuit and said scanning line terminal portions;

a third photomasking step of forming a positive resist that covers portions of said semiconductor layer which correspond to source electrodes and drain electrodes of said thin-film transistor elements, and said picture-elements electrodes; and

a passivation step of subjecting a back channel portion of each of said thin-film transistor elements to a plasma doping treatment with a B_2H_6 gas, and coating said back channel portion with a layer formed of one of BCB, polyphenyl silazane and an organic material by ink-jet coating or flexo graphic printing method.